

RECENT EARTHQUAKES.

August 1.—At Port au Prince, Haiti, one minute before noon, a very slight shock.

August 7.—San Francisco, Oakland, Berkeley, and Alameda, very slight shock just before noon, noticed principally by means of delicate seismographs. At Berkeley the shock occurred at 11:58, and the seismographs on the campus of the university recorded a movement from south to north without any perceptible vertical motion. The cable report from Messina, Italy, records a severe earthquake at that place at 2:33 a. m. of August 6, which would be about 4:30 p. m. of August 5, San Francisco time, so that this shock could not be the same as that felt in California on the 7th.

August 12.—Seattle, Wash: Two slight shocks of about four seconds duration were felt during the night of the 12-13th.

August 27.—By cablegram to the New York World, it appears that four earthquake shocks occurred at Santiago de Cuba between 11:10 and 11:15 a. m. of this date.

Seismographs at Washington, D. C., and Cleveland, Ohio, recorded no shocks during August.

EARTHQUAKES IN CENTRAL AND SOUTH AMERICA.

The "Antonio Alzate" Society, of the City of Mexico, in its memoirs, has published two papers by F. de Montessus de Ballore, Chief of Artillery, in one of which he describes the earthquakes of Mexico, and in the second, those of Spanish America from the Isthmus of Tehautepec to Cape Horn. This latter immense region he divides into six seismic centers, which he arranges in the order of decreasing seismicity as follows:

No. 1. Central America: This embraces six special regions, including 108 localities in which the record of earthquakes enumerates 2,659 shocks. The seismic action is in general clearly localized or restricted to the Pacific slope.

No. 2. The northern Andes, including Trinidad, Panama, and Guayaquil. This includes ten seismic regions, 117 localities, and 1,385 shocks.

No. 3. The central Andes, including Chile and the eastern Cordilleras in Bolivia. We have here four seismic regions, 61 localities, and 2,884 shocks.

No. 4. The southern Andes, extending to Cape Horn, including 5 regions, 72 localities, and 2,956 shocks.

No. 5. The Atlantic coast of South America, including 2 regions, 29 localities, and 56 shocks.

No. 6. The Antilles: One region, 20 localities, and 157 shocks.

The minor regions, of which there are 28 in all, are also arranged by Montessus de Ballore in the order of seismic activity, as follows: Salvador, Costa Rica, northern Cnile, Guatemala, Panama, central coast of Peru, Paria, Venezuela proper, Quito, central Chile, southern Chile, Tucuman, southern coast of Peru, Haiti, and San Domingo, Venezuelan Andes, and finally Guayaquil.

THE AUSTRALIAN WEATHER GUIDE.

According to an article in the last number of the Journal of the Manchester Geographical Society, the Government of Queensland, Australia, has decided "to publish a thoroughly scientific almanac dealing principally with the new science of meteorology." This publication is to be edited by Mr. Clement L. Wragge, the energetic Chief of the Brisbane Meteorological Office. Mr. Wragge in his note concerning this "Weather Guide" says:

It will appeal to the sympathies of the squatter, the farmer, the agriculturist, horticulturist, the miner, and particularly the sailor and

the invalid. It will show how forecasts are made, and give examples of the conditions that precede transcontinental rains, thunderstorms, cold spells, southerly bursters, tropical hurricanes, and other interesting phenomena.

The principal meteorological instruments will be described and directions given for their use. We shall investigate the depths of the antarctic V-shaped depressions which are like atmospheric valleys attached to the low belts of low pressure around the antarctic circle. We shall, in mind, accompany some noble vessel under the influence of such a storm and see the conditions under which the upper topsails are sent up to the cheery chanty of "Reuben Ranzo." Paragraphs will be devoted to horticulture operations. * * * We shall not forget our friends the bushmen, the lonely swagmen, and the teamsters, for whom we have a profound respect.

These eloquent words suggest an excellent field of activity for some of our own voluntary observers and section directors. The almanac is still the guide and friend to the farmer and planter, and if its scientific articles are not written in too technical and too abstruse a style, a Weather Bureau almanac would be highly useful in the homes of our farmers. Of course, its editor would not make the mistake of attempting long range predictions, or any other non-scientific display of his wisdom, but within certain limitations an annual meteorological almanac would be a worthy companion to the monthly section report for each State.

Mr. Alva Agee, in an article in the National Stockman and Farmer of August 4, has well said:

In view of the weather's unpopularity, it is remarkable that there is such a general craving for foreknowledge of its character for future months that fakirs can make money out of this craving. Almanacs have suffered great loss in circulation in recent years, and their weather predictions have been supplanted in the public's affection by the predictions of a few fakirs or prophets as published in many of the leading papers. It is a well-known scientific fact that these predictions of weather for weeks or months ahead are the purest guess work, and their publication reflects no credit upon our intelligence as a people.

Of course neither the Australian Weather Guide nor any almanac published by a Weather Bureau official would for a moment encourage a discreditable attempt to pander to the general craze for an insight into the weather of the coming season.

RIBBON LIGHTNING.

The Weather Bureau has received two very interesting photographs of lightning from Rev. J. Stewart-Smith, rector of St. Mary's Church, Kansas City, Mo. They were taken on July 28, at about 11:30 p. m. The camera was a Premo B, 4 by 5, diaphragm 8. The photographs were taken on a Cramer plate, crown brand, and we regret that the interesting details in these lightning flashes can not easily be reproduced by photogravure processes. By the help of the chimney stack, 72 feet distant from the lens, we are able to infer that the apparent angular diameter of the width of the ribbon flash was about half a degree, but the foreshortening of the ribbon was such that its full width would have subtended an angle of at least 1°. As the lightning flash certainly struck the building and passed very close to the top of the chimney, the actual width of the ribbon must have been not less than 2 feet. We know of but one other photograph of ribbon lightning in which it has been possible to approximate to the width of the ribbon. That gave a width of about 3 feet. The photograph was taken, with the camera looking eastward, from the rear of a rapidly-moving railroad train in Dakota, by Mr. W. T. Jennings, of Philadelphia, who states that he has frequently manufactured ribbon lightning by moving the camera across an oscillating discharge. But photographs of ribbon lightning are not taken in any such way. A discharge of lightning is too fleeting to be influenced by the motion of the camera. With artificial oscillatory discharges one may so control the time of the discharges and the motion of the sensitive film as to produce the appearance of a ribbon;

but no motion of the camera seems likely to explain the many details in these ribbon photographs of natural lightning. On the contrary, there is one flash on Mr. Stewart-Smith's plate that has every indication of being certainly an oscillatory discharge, showing lines of flow identical with those photographed by Professor Trowbridge at Cambridge, and fully maintaining his conclusion, which was also that of Prof. Joseph Henry and J. Ogden Rood, that the lightning flash is an oscillatory discharge, repeated frequently to and fro within the crack in the air that is opened up by the first discharge. The whole process requires but a few millionths of a second, and the motion of the camera within that short time is insignificant.

THE KITE AND TELEPHONE.

On page 257 of the MONTHLY WEATHER REVIEW for June, 1898, we have referred to some interesting experiments on H. M. S. *Dauntless*, concerning which the Aeronautical Journal states that there is no such ship, that no such experiments were made in the navy, and that in recent kite experiments made on the torpedo boat destroyer *Daring* the kites were of the Baden-Powell pattern.

In a letter on this subject from Mr. S. P. Fergusson, of Blue Hill, he says:

The only experiments with kite telephones or telephone kites that I know of have been made in this country by Mr. William A. Eddy, of New York, who nearly two years ago succeeded in telephoning and telegraphing over a line held by kites. See Boston Herald, December 7, 1896 (or perhaps New York Herald of same date). It seems that the wire was carried over trees, several roadways or streets, etc., and lowered so that connections were readily made and messages sent. After all, the Americans are still ahead in the matter of kites for scientific purposes.

A MEMORIAL TO VOLTA.

The study of electricity begins with the discoveries of Galvani and Volta, especially the invention of the dry pile by the latter. The electricians of Italy announce that they have organized a committee, with a central office in Milan, to organize an international electrical exposition, to be held at Como, on Lake Como, in May, 1899, to which they invite the cooperation of telegraphers and electricians throughout the world. It is proposed to deposit a bronze crown at the foot of the statue of Volta that his native town long since erected to the celebrated electrician. A more delicate tribute could scarcely be imagined, and the Americans who may be able to

be present at the ceremony will undoubtedly witness one of the most beautiful scenes of this century of centennials.

STUDIES OF THE JAPAN CURRENT.

We notice in several California papers earnest articles advocating the study of the Japan current and its relation to the weather of the Pacific coast. Especially does Mr. W. S. Prosser, of Auburn, Cal., state that in 1878 or 1879 he suggested this very thing and urged favorable action on the authorities at Washington.

It ought hardly to be necessary to assure the citizens of the Pacific coast that the Japan Current, like the Gulf Stream, has been studied with much care by the navigators of all nations, and charts have been published showing the temperature and the movement of the surface water, not only for these special currents, but for the whole of the surrounding ocean for each month in the year. These charts show that without any doubt whatever the currents as such soon dwindle away, and all that is left is a very slow movement of the water too and fro with the wind. It is the west wind that strikes our Pacific coast, and not the Japan Current. This wind brings moisture from the Pacific Ocean, and not from the neighborhood of Japan. It is these moist winds, and not the ocean currents that control the climate of California.

The hydrographic offices of all nations are engaged in the study of ocean currents and surface drifts as such, including their dependence upon the winds. The meteorologist studies the winds as affected by the surfaces of the land and ocean, but he finds the atmosphere moving so rapidly and its various portions so easily intermixed with each other that it is at present impossible to tell whether the moisture brought by the wind to California comes from the Pacific Ocean in general, or from the Japan Current especially. In fact, it matters little to him where it comes from. He has to take it as he finds it over California, and then decide whether it is rising and cooling to form cloud and rain, or whether it is descending and likely to stay unprecipitated. The important features of the weather of California depend principally upon whether its winds are descending and being pushed outward from a high and dry area to the northeastward, or whether they are ascending and coming from moister air to the northwestward. It is the air supplied from the high pressure area on the southwest between California and Hawaii that gives the former her long continued spells of dry, clear weather. The length of these spells may depend, in a general way, upon atmospheric conditions; not on the condition of the ocean.

METEOROLOGICAL TABLES AND CHARTS.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

Table I gives, for about 130 Weather Bureau stations making two observations daily and for about 20 others making only one observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation, the total depth of snowfall, and the mean wet-bulb temperatures. The altitudes of the instruments above ground are also given.

Table II gives, for about 2,700 stations occupied by voluntary observers, the highest maximum and the lowest minimum temperatures, the mean temperature deduced from the average

of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (. . .).

Table III gives, for about 30 stations furnished by the Canadian Meteorological Service, Prof. R. F. Stupart, director, the means of pressure and temperature, total precipitation and depth of snowfall, and the respective departures from normal values, except in the case of snowfall.

Table IV gives, for 26 stations selected out of 113 that maintain continuous records, the mean hourly temperatures de-